

WHAT IS CLAIMED IS:

1. A reaction solution for use in image recording in conjunction with an ink containing a coloring material in a dissolved or dispersed state, the reaction solution destabilizing the dissolved or dispersed state of the coloring material in the ink in contact with the ink,

the reaction solution comprising a polyvalent metal ion and an organic solvent, has a pH of 2 or higher, and has a buffering action for variations in pH, wherein the buffering action means it can maintain pH variation within the range of 0.5 before and after the addition of 1.0 ml of a 0.1 N aqueous lithium hydroxide solution to 50 ml of the reaction solution.

2. The reaction solution according to claim 1, wherein the amount of the polyvalent metal ion is from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.

3. The reaction solution according to claim 1, wherein the reaction solution further contains a strong acid ion.

4. The reaction solution according to claim 1, wherein the reaction solution contains a buffer.

5. The reaction solution according to claim 1,  
wherein the pH of the reaction solution is 7 or lower.

6. A set of an ink and a reaction solution  
5 comprising the ink containing a coloring material in  
a dissolved or dispersed state, and the reaction  
solution capable of destabilizing the dissolved or  
dispersed state of the coloring material in the ink  
in contact with the ink,  
10 wherein the reaction solution contains a  
polyvalent metal ion and an organic solvent, has a pH  
of 2 or higher, and has a buffering action for  
variations in pH, wherein the buffering action means  
it can maintain pH variation within the range of 0.5  
15 before and after the addition of 1.0 ml of a 0.1 N  
aqueous lithium hydroxide solution to 50 ml of the  
reaction solution.

7. An inkjet recording apparatus comprising a  
20 recording head for discharging an ink containing a  
coloring material in a dissolved or dispersed state,  
an ink cartridge having an ink storage unit  
containing the ink, ink supply means for supplying  
the ink from the ink cartridge to the recording head,  
25 and means for supplying a reaction solution capable  
of destabilizing the dissolved or dispersed state of  
the coloring material in the ink in contact with the

ink,

wherein the reaction solution contains a polyvalent metal ion and an organic solvent, has a pH of 2 or higher, and has a buffering action for variations in pH, wherein the buffering action means it can maintain pH variation within the range of 0.5 before and after the addition of 1.0 ml of a 0.1 N aqueous lithium hydroxide solution to 50 ml of the reaction solution.

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8. The inkjet recording apparatus according to claim 7, wherein the amount of the polyvalent metal ion is from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.

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9. The inkjet recording apparatus according to claim 7, wherein the reaction solution further contains a strong acid ion.

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10. The inkjet recording apparatus according to claim 7, wherein the reaction solution contains a buffer.

11. The inkjet recording apparatus according to claim 7, wherein the pH of the reaction solution is 7 or lower.

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12. The inkjet recording apparatus according to claim 7, wherein the pH of the reaction solution is lower than the pH of the ink.

5           13. The inkjet recording apparatus according to claim 7, wherein the viscosity of the reaction solution is greater than the viscosity of the ink.

10           14. The inkjet recording apparatus according to claim 7, comprising a coating roller for coating the reaction solution on a recording medium.

15           15. The inkjet recording apparatus according to claim 14, wherein the amount of the reaction solution applied on the recording medium is from 0.5 g/m<sup>2</sup> to 10 g/m<sup>2</sup> inclusive.

20           16. An image recording method comprising a step of coating a recording medium with a reaction solution capable of destabilizing the dissolved or dispersed state of a coloring material in an ink in contact with the ink containing the coloring material in a dissolved or dispersed state, and a step of coating the ink on the recording medium by the inkjet method,

25           wherein the reaction solution contains a polyvalent metal ion and an organic solvent, has a pH

of 2 or higher, and has a buffering action for variations in pH, wherein the buffering action means it can maintain pH variation within the range of 0.5 before and after the addition of 1.0 ml of a 0.1 N aqueous lithium hydroxide solution to 50 ml of the reaction solution.

17. The image recording method according to claim 16, wherein the amount of the polyvalent metal ion is from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.

18. The image recording method according to claim 16, wherein the reaction solution further contains a strong acid ion.

19. The image recording method according to claim 16, wherein the reaction solution contains a buffer.

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20. The image recording method according to claim 16, wherein the pH of the reaction solution is 7 or lower.

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21. The image recording method according to claim 16, wherein the pH of the reaction solution is lower than the pH of the ink.

22. The image recording method according to claim 16, wherein the viscosity of the reaction solution is greater than the viscosity of the ink.

5           23. The image recording method according to claim 16, wherein coating of the reaction solution on the recording medium is carried out by a coating roller.

10           24. The image recording method according to claim 23, wherein the amount of the reaction solution applied on the recording medium is from  $0.5 \text{ g/m}^2$  to  $10 \text{ g/m}^2$  inclusive.